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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/722,563	Applicant(s) YOSHIMURA ET AL.	
	Examiner Johannes P. Mondt	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 13-16 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 13-16 and 18-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/21/05 has been entered.

Response to Amendment

After-Final Amendment filed 10/26/05 has been entered following aforementioned Request for Continued Examination. In said Amendment Applicant substantially amended claims 1, 14, 19 20, and dependent claims, and cancelled claims 6-12 and 17. Claims 1-5, 13-16 and 18-26 are in the application.

Comments on Remarks submitted with said Amendment are included below under "Response to Arguments".

Specification

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. The specification is objected to because in the chemical composition formula on page 22, lines 21-27, both parameters "m" and "n", while quantified, are not defined: neither "m" nor "n" actually occur in said chemical composition formula.

Said chemical composition formula should be replaced by an explicit formula in which the stoichiometric composition is unequivocally defined.

2. The specification is objected to because beta sialon as defined by the specification does not contain a metal for which metal M as one or more selected from Ce, Pr, Eu, Tb, Yb and Er as recited in claims 1 and 19 may be selected. Instead, beta sialon (i.e., β -sialon) according to the specification (page 20, lines 20-23) is defined as $\text{Si}_{6-x}\text{Al}_x\text{O}_x\text{N}_{8-z}$ with $0 < z < 0.2$. In this definition, the only metal is aluminum (Al) and this metal selection is fixed. Therefore, the language of said claims 1 and 19, and claims dependent thereon (claims 2-5, 13 and 21-26) is indefinite.
3. The specification is objected to because " β -sialon" has not been defined by a stoichiometric formula, while " β " merely indicates crystal phase. The specification should be amended to contain said stoichiometric formula without introducing new matter, i.e., without further limiting the disclosure of β -sialon.

Claim Objections

1. ***Claims 1-5 and 19 and 21-26*** are objected to because of the following informalities: the wording "of 40 %weight % or more and 90 weight % or less" (claim 1, line 7 and claim 19, lines 5-6) should be replaced by "of a weight relative to total weight of the phosphor in the range between 40 weight % to 90 weight %". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 1-5, 13, 19 and 21-26** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, because the specification, on page 20, lines 20-23, defines β -sialon as $\text{Si}_6\text{Al}_x\text{O}_x\text{N}_{8-z}$ with $0 < z < 0.2$ the limitation "metal (M), β -sialon" (claim 1, line 10 and claim 19, line 9) is indefinite.
1. **Claims 14-16 and 18** recite through claim 14, line 7, the limitation "x". There is insufficient antecedent basis for this limitation in the claim. A stoichiometric parameter is only definite if it defines a stoichiometric ratio of two definite material substances. There is no such ratio defined, either by chemical composition in which "x" features, nor in words.
2. **Claim 20** recites the limitation "x". There is insufficient antecedent basis for this limitation in the claim. A stoichiometric parameter is only definite if it defines a stoichiometric ratio of two definite material substances. There is no such ratio defined, either by chemical composition in which "x" features, nor in words.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

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granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-5** are rejected under 35 U.S.C. 102(e) as being anticipated by Mitomo et al (6,632,379 B2).

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Mitomo et al teach a light emitting apparatus (title, abstract and columns 1-12, i.p. col. 5) comprising: a light emitting element with an emission wavelength in a range of 360 nm to 550 nm (column 1, line 62); and a rare earth element doped oxide nitride phosphor (see abstract), wherein a part of the light radiated from the light emitting element is wavelength-converted by the phosphor (column 1, line 5 – column 2, line 46), and the phosphor comprises a sialon system phosphor powder comprising α -sialon of weight percentage (as ratio of total weight) in the range between 40 weight % to 90 weight % (Example 9, column 3, lines 21-30; column 11, lines 5-20 and abstract) (namely: 68 weight %), the α -sialon being structured such that a Ca site of Ca- α -sialon represented by $(\text{Ca}_x\text{M}_y)\text{Si}_{1-z1}\text{Al}_{z1}\text{O}_{1-z2}\text{N}_{z2}$ ($0 \leq z_n \leq 1$, $n=1,2$) is partially replaced by metal (M) β -sialon of a weight % (as percentage of total phosphor weight) between 40% and

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90% (namely: 68% (abstract and Example 9, column 11, line 5-20), and un-reacted silicon nitride of a weight % (as percentage of totals phosphor weight) of 30% or less, where M comprises metal that is one or more selected from Ce, Pr, Eu, Tb, Yb, and Er, namely: among Eu, Tb, Yb and Er, e.g., Eu (Example 9, column 11, lines 5-20) and $0.05 < (x+y) < 0.3$, $0.02 < x < 0.27$ and $0.03 < y < 0.3$ (namely: $x=0.11$ and $y=0.06$).

On claim 2: the emission wavelength is in the range of 450 nm to 550 nm (namely: 450 – 550 nm) (col. 1); and the light emitting apparatus radiates white light (col. 1, l. 5-15) generated by a mixture of the wavelength-converted light and an other part of light radiated from the light emitting element (the latter limitation being satisfied because inherently the probability of conversion for any single primarily excited photon is governed by Lambert's Law [see, e.g., M. Fukuda, "Optical Semiconductor Devices", Wiley Series in Microwave and Optical Engineering (1999), page 42], which is exponential).

On claim 3: the oxide nitride phosphor comprises an oxide nitride that contains the α -sialon as a matrix material (column 1, lines 14-20 and cols. 5-6).

On claim 4: the phosphor comprises a powder or particle (col. 3, l. 21-30) and is contained in a light transmitting material (as otherwise light could not be emitted by the phosphors as light output resulting in white light, the primary emission being in the blue/UV part of the spectrum).

On claim 5: the light-emitting element comprises a group II nitride system compound semiconductor light emitting element (column 1).

On claim 19: Mitomo et al teach a light-emitting method for a light-emitting apparatus that comprises a light emitting element with an emission wavelength in a range of between 360 to 550 nm (namely: 450 nm – 550 nm) and a rare earth element (among Eu, Tb, Yb, Er, e.g., Eu) doped oxide nitride phosphor wherein a part of the light radiated from the light emitting element is wavelength-converted by the phosphor (column 1, line 5 – column 2, line 46), and the phosphor comprises α - sialon system phosphor powder comprising α -sialon of weight percentage (as ratio of total weight) in the range between 40 weight % to 90 weight % (Example 9, column 3, lines 21-30; column 11, lines 5-20 and abstract) (namely: 68 weight %), the α -sialon being structured such that a Ca site of Ca- α -sialon represented by $(\text{Ca}_x\text{M}_y)\text{Si}_{1-z1}\text{Al}_{z1}\text{O}_{1-z2}\text{N}_{z2}$ ($0 \leq z_n \leq 1$, $n=1,2$) is partially replaced by metal (M) β -sialon of a weight % (as percentage of total phosphor weight) between 40% and 90% (namely: 68% (abstract and Example 9, column 11, line 5-20), and un-reacted silicon nitride of a weight % (as percentage of totals phosphor weight) of 30% or less, where M comprises metal that is one or more selected from Ce, Pr, Eu, Tb, Yb, and Er, namely: Eu (Example 9, column 11, lines 5-20) and $0.05 < (x+y) < 0.3$, $0.02 < x < 0.27$ and $0.03 < y < 0.3$ (namely: $x=0.11$ and $y=0.06$).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1 and 3-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellens et al (US 2003/0052595 A1) (column 1, line 65 – column 2, line 17) in view of Asayama et al (JP 04021570).

On claim 1: Ellens et al teach ([0004]-[0041]) a light emitting apparatus (title, abstract) comprising: a light emitting element with emission wavelength in a range of 300 nm to 485 nm substantially overlapping the claimed range; see [0004]); and a rare-earth element doped oxide nitride phosphor ([0005]), wherein a part of the light radiated by the light-emitting element is wavelength converted by the phosphor (abstract), and the phosphor comprises a sialon system phosphor powder (see [0003] for definition of sialon as α -sialon by Ellens et al; [0012]; see [0031], first sentence, for "powder") represented by $\text{Ca}_x\text{M}_y\text{Si}_{1-y}\text{Al}_y\text{O}_{16-z}\text{N}_z$ where M comprises metal selected from Ce, Pr, Eu, Tb, Yb and Er, namely: Ce (see [0031]) with $x \leq 0.25$ and $y = 10\%$ of x , i. e. , thus meeting the claimed inequalities $0.05 < (x+y) < 0.3$ and $0.03 < y < 0.3$.

Ellens do not necessarily teach the limitation that said alpha sialon is partially replaced by metal-M β -sialon of 40 weight % or less and un-reacted silicon nitride of 30 weight % or less. However, it would have been obvious to include said limitation in view of Asayama et al, who teach to convert α -sialon to a mixture of α -sialon (cf. English abstract, "Constitution"), for instance of 75 weight % and β -sialon 25 weight % (Table 2) so as to increase mechanical strength and fracture toughness (see English abstract, "Purpose"). Furthermore, in the combined invention both crystal phases of sialon do inherently contain un-reacted silicon nitride, because the stoichiometric expressions prove that the majority of "(Si,Al) $_{12}$ (O,N) $_{16}$ ", interpreted here as $\text{Si}_{1-a}\text{Al}_a\text{O}_b\text{N}_{1-b}$ units do

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not contain Al and most of the latter do not contain any Ca nor Ce either, considering that that Si is present ($a < 1$) while $x+y$ is significantly less than 12. *Motivation* to include the teaching by Asayama et al in the invention by Ellens et al immediately follows from the improved mechanical strength and fracture toughness as recited by Asayama et al.

On claim 3: the oxide nitride phosphor comprises an oxide nitride that contains the α -sialon as a matrix material, matrix material being defined as the sialon with the Ce as luminescence center (loc.cit.).

On claim 4: the phosphor comprises a powder or particles and is containing in a light transmitting material (inherently so as otherwise light could neither reach the luminescence centers (Ce) nor leave the matrix material (the sialon) after having been wavelength-converted.

On claim 5: the light-emitting element comprises a III-group nitride system compound (see [0025]).

3. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellens et al and Asayama et al as applied to claim 1 above, and further in view of Shimizu et al (5,998,925).

As detailed above, claim 1 is unpatentable over Ellens et al in view of Asayama et al. Neither Ellens et al nor Asayama et al necessarily teach the further limitation defined by claim 2. *However, it would have been obvious to include said further limitation in view of Shimizu et al*, to whom Ellens et al refer stating their LED is similar to the one taught by Shimizu et al, said LED by Shimizu et al emitting a primary radiation within the range of

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400 nm – 530 nm (column 4, lines 43-49). Applicant is reminded that a *prima facie* case of obviousness typically exists when the ranges as claimed overlap the ranges disclosed in the prior art or when the ranges as claimed do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

4. **Claims 14-16 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al (6,717,353 B1).

The following rejection is provided subject to the noted indefiniteness under 35 U.S.C. 112, second paragraph (see above), and with the interpretation explained in the rejection on the meaning of the stoichiometric parameter x to the best understanding of examiner.

Mueller et al teach a light emitting apparatus (see title), comprising: a light-emitting element with an emission wavelength in a range (comprising a blue and UV range [see column 1, lines 10-36 and abstract, final sentence], the blue range of the electromagnetic spectrum being between 455 nm and 492 nm; see Academic Press Dictionary of Science and Technology; see also the ultraviolet range, which also overlaps the range as claimed, namely: wavelengths less than about 380 nm; see again Academic Press Dictionary of Science and Technology) that substantially overlaps with the range (360 nm – 550 nm) as claimed; and a cerium-ion doped lanthanum silicon nitride phosphor (column 4, line 61 – column 5, line 22), wherein a part of light radiated from the light-emitting element is wavelength converted by the phosphor (column 4, line

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64), a doping amount x (" x " here being interpreted as the stoichiometric ratio of cerium divided by the total stoichiometric parameter of cerium and (i.e., plus) lanthanum within said cerium-ion doped lanthanum silicon nitride), x being in the range between 0.01 and .5 (column 5, line 3: N.B.: " x " of applicant corresponds to a of Mueller et al, being the stoichiometric parameter defined above); said range for " x " thus substantially overlapping the range as claimed ($0.0 < x < 0.2$), while, to teach a range end points must be at least infinitesimally close to the invention as reduced to practice; hence Mueller et al at least teach one data point for said stoichiometric parameter known to correspond to an electron beam excitation phosphor, i.e., within the range $0.0 < x < 0.2$.

Applicant is reminded that a *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art or when the ranges of a claimed composition do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

Finally, on the basis of the teaching of at least one embodiment with ax in the claimed range said phosphor, being a cerium-doped lanthanum silicon nitride phosphor, is an electron beam excitation phosphor at least according to the definition thereof in the specification.

On claim 15: said phosphor is represented by $\text{La}_{1-x}\text{Si}_x\text{N}_5:x\text{Ce}$ (column 5, line 1 and line 3, Mueller's " a " being the relevant stoichiometric parameter as defined above as " x ") where the doping amount x is $0 < x < 1$ (loc.cit.), and cerium ion is doped to a

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lanthanum site in a solid dissolution replacement (because otherwise "sites" such as for lanthanum do not exist).

On claim 16: a doping amount x is $0.1 < x < 0.5$ (column 5, line 3), and the phosphor comprises an UV excitation phosphor (UV light is emitted too from the light-emitting element (see abstract, final sentence and column 4, line 61 – column 5, line 6).

On claim 18: the phosphor by Mueller et al radiates blue light (column 4, line 64 – column 5, line 3).

5. **Claims 19 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellens et al in view of Asayama et al and Yoneda (US 2004/0109302 A1).

Ellens et al teach ([0004]-[0041]) a light emitting method by obvious application of the light-emitting apparatus (title, abstract) comprising: a light emitting element with emission wavelength in a range of 300 nm to 485 nm substantially overlapping the claimed range; see [0004]); and a rare-earth element doped oxide nitride phosphor ([0005]), wherein a part of the light radiated by the light-emitting element is wavelength converted by the phosphor (abstract), and the phosphor comprises a sialon system phosphor powder (see [0003] for definition of sialon as α -sialon by Ellens et al; [0012]; see [0031], first sentence, for "powder") represented by $\text{Ca}_x\text{M}_y\text{Si}_{1-y}\text{Al}_y\text{O}_{16-z}\text{N}_z$ where M comprises metal selected from Ce, Pr, Eu, Tb, Yb and Er, namely: Ce (see [0031]) with $x \leq 0.25$ and $y = 10\%$ of x , i. e., thus meeting the claimed inequalities $0.05 < (x+y) < 0.3$ and $0.03 < y < 0.3$.

Ellens do not necessarily teach the limitation that said α sialon is partially replaced by metal-M β -sialon of 40 weight % or less and un-reacted silicon nitride of 30

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weight % or less. *However, it would have been obvious to include said limitation in view of Asayama et al*, who teach to convert α -sialon to a mixture of α -sialon (cf. English abstract, "Constitution"), for instance of 75 weight % and β -sialon 25 weight % (Table 2) so as to increase mechanical strength and fracture toughness (see English abstract, "Purpose"). Furthermore, in the combined invention both crystal phases of sialon do inherently contain un-reacted silicon nitride, because the stoichiometric expressions prove that the majority of "(Si,Al)₁₂(O,N)₁₆", interpreted here as Si_{1-a}Al_aO_bN_{1-b} units do not contain Al and most of the latter do not contain any Ca nor Ce either, considering that that Si is present (a<1) while x+y is significantly less than 12. *Motivation* to include the teaching by Asayama et al in the invention by Ellens et al immediately follows from the improved mechanical strength and fracture toughness as recited by Asayama et al.

Neither Ellens et al nor Asayama et al necessarily teach the further limitation of turning on intermittently the light emitting element. However, it would have been obvious to include said limitation in view of Yoneda et al, who teach the application of white light emitting elements to plant cultivation methods. *Motivation* to include the teaching by Yoneda et al in the invention by Ellens et al least derives from the obvious application of the method of using a light emitting element by Ellens et al to plant cultivation, given the output of white light by the method of Ellens et al (see [0001] in Ellens et al)).

On claim 25: the light emitting element by Ellens et al comprises a group III nitride system compound semiconductor light emitting element.

6. **Claims 20 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al (6,717,353 B1) in view of Yoneda et al (US 2004/0109302 A1),

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and, in the alternative, over Ellens et al (US 2003/0052595 A1) in view of Yoneda et al (US 2004/0109302 A1).

Mueller et al teach a light-emitting method for a light-emitting apparatus that comprises a light-emitting element with an emission wavelength in a range comprising blue and UV, hence at least the blue range, which is at least the range from 455 nm to 492 nm; see Academic Press Dictionary of Science and Technology; N.B.: the ultraviolet (UV) range also overlaps with the range as claimed, being defined as wavelengths bordering 380 nm from below; loc.cit.) that at least substantially overlaps with the range of 360 nm –550 nm as claimed, and a cerium-ion doped lanthanum silicon nitride phosphor (col. 4, line 61 – column 5, line 3), wherein part of the light radiated from the light emitting element is wavelength-converted by the phosphor (column 4, line 64), a doping amount “x” satisfies $0.01 < x < 0.5$ thus substantially overlapping with the range defined by the double inequality $0.0 < x < 0.2$ as claimed (column 5, line 3), the phosphor comprises an electron beam excitation phosphor (by virtue of satisfying substantial overlap with the stoichiometric range admitted by applicant as defining electron beam excitation phosphor, and the light emitting apparatus radiates light generated from a mixture of wavelength-converted light (column 4, line 61 – column 5, line 21) and another part of light radiated from the light emitting element (the latter limitation being satisfied because inherently the probability of conversion for any single primarily excited photon is governed by Lambert's Law [see, e.g., M. Fukuda, “Optical Semiconductor Devices”, Wiley Series in Microwave and Optical Engineering (1999), page 42], which is exponential).

Mueller et al do not necessarily specifically teach the limitation “turning the light emitting on intermittently”. However, it would have been obvious to include said limitation in view of Yoneda et al, who teach the application of white light emitting elements to plant cultivation methods.

Motivation to include the teaching by Yoneda et al in the invention by Mueller et al at least derives from the obvious application of the method of using a light emitting element by Mueller et al to plant cultivation, given the output of white light by the method of Mueller et al (see abstract in Mueller et al).

Ellens et al teach a light-emitting method for a light-emitting apparatus that comprises a light-emitting element with an emission wavelength in a range that substantially overlaps with the range as claimed, namely the range at least comprising the range from 380 nm to 420 nm; loc.cit.), and a cerium-ion doped lanthanum silicon nitride phosphor ([0005])), wherein part of the light radiated from the light emitting element is wavelength-converted by the phosphor ([0005]), a doping amount “x” being 0.5 to 15% of total metal, hence considering the range of p thus substantially overlapping with the range defined by the double inequality $0.0 < x < 0.2$ as claimed, the phosphor comprises an electron beam excitation phosphor (by virtue of satisfying substantial overlap with the stoichiometric range admitted by applicant as defining electron beam excitation phosphor, and the light emitting apparatus radiates light generated from a mixture of wavelength-converted light and another part of light radiated from the light emitting element (the latter limitation being satisfied because inherently the probability of conversion for any single primarily excited photon is

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governed by Lambert's Law [see, e.g., M. Fukuda, "Optical Semiconductor Devices", Wiley Series in Microwave and Optical Engineering (1999), page 42], which is exponential).

On claim 26: the light emitting apparatus by Mueller et al comprises a group III nitride system compound semiconductor emitting element (see their claim 14, for instance); similarly, the light emitting apparatus by Ellens et al comprises a group III compound semiconductor emitting element ([0002]).

7. **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellens et al, Asayama et al and Yoneda et al as applied to claim 19 above, and further in view of Lebens (6,095,661) (previously made of record).

As detailed above, claim 19 is unpatentable over Ellens et al, Asayama et al and Yoneda et al.

However, it would have been obvious to include limitation ad (b) in view of Lebens et al (see final sentence in abstract, Figure 9 and col. 13, l. 15-40), who teach the selective application of power (pulsed signals characterized by a certain frequency with feedback control) to LEDs of InGaN (hence analogous art) thus making use of the temperature-dependent color spectrum of said LED to control the spectrum (hence meeting claim 21). *Motivation* to include the teaching by Lebens et al thus derives from the added control of the light spectrum.

8. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al and Yoneda et al as applied to claim 20 above, and in the alternative over Ellens et al and Yoneda et al, and further in view of Lebens. (6,095,661).

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As detailed above, claim 20 is unpatentable over Mueller et al and Yoneda et al, and in the alternative, over Ellens et al and Yoneda et al, none necessarily teaching the further limitation defined by claim 22.

However, it would have been obvious to include limitation ad (b) in view of Lebens et al (see final sentence in abstract, Figure 9 and col. 13, l. 15-40), who teach the selective application of power (pulsed signals characterized by a certain frequency with feedback control) to LEDs of InGaN (hence analogous art) thus making use of the temperature-dependent color spectrum of said LED to control the spectrum. *Motivation* to include the teaching by Lebens et al thus derives from the added control of the light spectrum.

9. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellens et al, Asayama and Yoneda as applied to claim 19 above, and further in view of Shimizu et al (5,998,925).

As detailed above, claim 19 is unpatentable over Ellens et al in view of Asayama et al and Yoneda. Neither Ellens et al nor Asayama et al nor Yoneda necessarily teach the further limitation defined by claim 23. *However, it would have been obvious to include said further limitation in view of Shimizu et al*, to whom Ellens et al refer stating their LED is similar to the one taught by Shimizu et al, said LED by Shimizu et al emitting a primary radiation within the range of 400 nm – 530 nm (column 4, lines 43-49).

Applicant is reminded that a *prima facie* case of obviousness typically exists when the ranges as claimed overlap the ranges disclosed in the prior art or when the ranges as claimed do not overlap but are close enough such that one skilled in the art would have

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expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

10. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al/Ellens et al in view of Yoneda as applied to claim 20 above, and further in view of Shimizu et al (5,998,925).

As detailed above, claim 20 is unpatentable over Mueller et al in view of Yoneda et al. Neither Mueller et al (or Ellens et al) nor Yoneda et al necessarily teach the further limitation defined by claim 24. *However, it would have been obvious to include said further limitation in view of Shimizu et al*, teaching emitting a primary radiation within the range of 400 nm – 530 nm (column 4, lines 43-49). Applicant is reminded that a *prima facie* case of obviousness typically exists when the ranges as claimed overlap the ranges disclosed in the prior art or when the ranges as claimed do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

:Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422

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F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. **Claims 1 and 13** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent to Mitomo et al (6,632,379 B2). Although the conflicting claims are not identical, they are not patentably distinct from each other because for enablement of the claim in 6,632,379 B2 it is necessary to have at least one embodiment with less than 90% of α -sialon, as otherwise only 10% would have been available for the sum of b-sialon and un-reacted silicon nitride, in contradiction to the claimed ranges of b-sialon and un-reacted silicon nitride.

Response to Arguments

Applicant's arguments filed 10/26/05 have been fully considered but they are not persuasive in light of imperfections (see objections) and indefiniteness in the claim language and in light of new art regrettably not found earlier, as witnessed by the present rejections.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
January 9, 2006

Patent Examiner:

A handwritten signature in black ink, appearing to read 'J. Mondt', with a stylized flourish at the end.

Johannes Mondt (Art Unit: 3663)